A Pacific Northwest Geodetic Array (PANGA), providing constraints on North America – Juan de Fuca – Pacific plate interactions for geophysical and geologic modeling and earthquake hazards assessment" proposal dated April, 1998.

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M. Meghan Miller
Department of Geological Sciences
Central Washington University
Ellensburg, WA 98926
http//www.geology.edu/facstaff/meghan

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Abstract

Geodetic monitoring constrains geophysical and geologic models that resolve the kinematics and dynamics of deformation in the Pacific Northwestand characterize seismic risk. Recent development of permanent GPS arrays in the circum-Pacific region have dramatically advanced understanding of seismic cycle dynamics. In the Pacific Northwest, a regional GPS resources are coordinated by the PANGA (Pacific Northwest Geodetic Array) consortium. This project, as funded, consisted of: support for the annual PANGA community workshop that will include all federal and academic parties interested in PANGA planning, results, interpretation, and modeling of Pacific Northwest geodetic data, and funding for continued support of PANGA sites.

Goals of the project:

Geodetic monitoring constrains geophysical and geologic models that resolve the kinematics and dynamics of deformation in the Pacific Northwest. There are three important reasons to study this area: (1) Deformation of the Pacific Northwest results from superimposed plate forces oblique subduction of the Juan de Fuca plate; entrainment of the Sierra Nevada and Oregon Coast Ranges blocks and local forces created by topography. Geodetically constrained modeling discriminates their relative importance. (2) A paucity of detailed neotectonic studies, particularly in the geodetic time frame, in the Pacific Northwest creates problems in uniformly assessing earthquake hazard in the western U. S. (3) The deformation of the Pacific Northwest, involving important faults in both Seattle and Portland, poses significant seismic risk to the region.

Recent development of permanent GPS arrays in the circum-Pacific region have dramatically advanced understanding of seismic cycle dynamics (Figure 1). In the Pacific Northwest, a coordination of regional GPS resources under the PANGA (Pacific Northwest Geodetic Array) consortium is currently funded by the Geodetic Survey of Canada, US Geological Survey, and National Science Foundation and implemented by federal agencies and universities. The US portion of the network is in its first year of coordinated observations and systematic data analysis by a regional GPS data analysis facility at CWU. This network backbone supports studies that contribute to understanding of earthquake hazards near population centers such as Seattle, Portland, Vancouver, and the growing urban corridor in the Puget lowlands and Willamette Valley, as well as smaller but growing communities on the east flank of the Cascades.